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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/629,993	08/01/2000	Hwai-Tzuu Tai	81347JDL	6792

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EXAMINER	
THOMPSON, JAMES A	

ART UNIT	PAPER NUMBER
2624	

DATE MAILED: 03/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/629,993	TAI ET AL.	
	Examiner	Art Unit	
	James A. Thompson	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 December 2005 and 21 October 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *23 and 24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *23 and 24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 October 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 21 October 2005 has been entered.

Response to Arguments

2. Applicant's arguments, see page 8, lines 8-22, filed 21 October 2005, with respect to the drawings have been fully considered and are persuasive. The objections to the drawings listed in item 2 of the final rejection, dated 24 June 2005 and mailed 13 July 2005, have been withdrawn.

3. Applicant's arguments, see pages 8-16, filed 21 October 2005, with respect to the rejections of the claims under 35 USC 103(a) have been fully considered and are persuasive. Examiner agrees with Applicant that the newly added claims distinguish over Crean (US Patent 5,745,249), Shimura (US Patent 5,886,797), and Tai (US Patent 5,200,831), as set forth in said final rejection. Therefore, the rejections have been withdrawn. However, upon further consideration, new grounds of rejection are made in view of newly discovered prior art. Accordingly, prior art rejections are presented in detail below.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tai (US Patent 5,956,157) in view of Lee (US Patent 5,396,584).

Regarding claim 23: Tai discloses receiving image data that includes data representing a plurality of pixels (column 7, lines 49-58 of Tai), wherein each pixel of the plurality of pixels is associated with a location (column 7, lines 49-54 of Tai) and one of at least three intensities (column 7, lines 54-58 of Tai); accessing data in a memory, the data representing a halftone screen (figure 8 and column 7, line 65 to column 8, line 5 of Tai), the halftone screen including a plurality of halftone planes (figure 10A; and column 9, lines 39-41 and lines 50-56 of Tai), each halftone plane of the plurality of halftone planes including a plurality of cells (column 8, lines 41-45 of Tai), wherein each cell of the plurality of cells is associated with one of at least three microdot densities (column 8, lines 41-45 of Tai) being representative of a particular dot size capable of being printed by a gray-level printer (column 9, lines 43-50 of Tai); for each pixel ("current pixel") of the plurality of pixels: determining the intensity and the location of the current pixel (column 7, lines 49-51 and lines 54-58 of

Tai), selecting one of the plurality of halftone planes based at least upon the current pixel's intensity (figure 10A; and column 9, lines 39-41 and lines 50-56 of Tai), and associating one of the plurality of microdot densities in the selected halftone plane with the current pixel (column 9, lines 43-51 of Tai) based at least upon the current pixel's location (column 7, lines 49-54 and column 9, lines 7-11 of Tai); outputting the microdot densities associated with the plurality of pixels as first gray-level halftone data (column 8, lines 6-10 of Tai); blending the first gray-level halftone data with second gray-level halftone data resulting in blended-gray-level halftone data (column 9, lines 41-50 of Tai), wherein the blending weights the first gray-level halftone data and the second gray-level halftone data depending upon characteristics (contrast index) of the image data (column 10, lines 21-30 of Tai); and outputting the resultant blended-gray-level halftone data (column 8, lines 14-21 of Tai).

Tai does not disclose expressly performing edge enhancement on portions of the blended-gray-level halftone data that include text or high-contrast-edge data, thereby resulting in enhanced-blended-gray-level halftone data.

Lee discloses performing edge enhancement on portions of halftone data that include text or high-contrast-edge data, thereby resulting in enhanced halftone data (figure 2a; figure 2b; and column 5, lines 40-49 of Lee).

Tai and Lee are combinable because they are from the same field of endeavor, namely gray level halftone processing and digital gray level image data enhancement. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to additionally perform edge enhancement, as

taught by Lee, upon the blended-gray-level halftone data taught by Tai. The output data would then be enhanced-blended-gray-level halftone data. The motivation for doing so would have been that, without edge enhancement, jagged edges are formed rather than straight edges when the pixels are actually printed on a printer (column 5, lines 40-42 of Lee). Thus, edge enhancement clearly provides superior results in halftone printing. Therefore, it would have been obvious to combine Lee with Tai to obtain the invention as specified in claim 23.

Regarding claim 24: Tai discloses an image processing apparatus (figure 6 of Tai) comprising a memory storing data representing a halftone screen (figure 8 and column 7, line 65 to column 8, line 5 of Tai), the halftone screen including a plurality of halftone planes (figure 10A; and column 9, lines 39-41 and lines 50-56 of Tai), each halftone plane of the plurality of halftone planes including a plurality of cells (column 8, lines 41-45 of Tai), wherein each cell of the plurality of cells is associated with one of at least three microdot densities (column 8, lines 41-45 of Tai), the microdot densities being representative of a particular dot size capable of being printed by a gray-level printer (column 9, lines 43-50 of Tai). Since the data is clearly stored, some form of memory is inherent in the system of Tai.

Tai further discloses a first halftone circuit (figure 6 (160(portion)) and column 7, lines 40-44 of Tai) configured at least to: receive image data that includes data representing a plurality of pixels (column 7, lines 49-58 of Tai), wherein each pixel of the plurality of pixels is associated with a location (column 7, lines 49-54 of Tai) and one of at least three intensities (column 7, lines 54-58 of Tai), and for each pixel

("current pixel") of the plurality of pixels: determine the intensity and the location of the current pixel (column 7, lines 49-51 and lines 54-58 of Tai), select one of the plurality of halftone planes based at least upon the current pixel's intensity (figure 10A; and column 9, lines 39-41 and lines 50-56 of Tai), associate one of the plurality of microdot densities in the selected halftone plane with the current pixel (column 9, lines 43-51 of Tai) based at least upon the current pixel's location (column 7, lines 49-54 and column 9, lines 7-11 of Tai), and output the microdot densities associated with the plurality of pixels as first gray-level halftone data (column 8, lines 6-10 of Tai).

Tai further discloses a second halftone circuit (figure 6 (160(portion)) and column 7, lines 40-44 of Tai) configured at least to receive the image data and output second gray-level halftone data (column 8, lines 48-54 of Tai). At least a first gray-level halftone data and a second gray-level halftone data are generated, each corresponding to a separate halftone screen (column 8, lines 48-54 of Tai). Since the unified rendering controller (figure 6(160) of Tai) performs the rendering of the scanned gray level image data (column 7, lines 40-44 of Tai) that the blending screen logic control (figure 6(150) of Tai) later blends (column 9, lines 41-50 of Tai), then the first halftone circuit and the second halftone circuit are physically embodied within the unified rendering controller. The first halftone circuit and the second halftone circuit each correspond to their respective portions of the unified rendering controller, such as specific physical circuitry or specific physically-embodied software that is executed by a processor.

Tai further discloses a blending circuit (figure 6(150) of Tai) communicatively connected to the first halftone circuit and the second halftone circuit (as clearly shown in figure 6 of Tai) and configured at least to blend the first gray-level halftone data with second gray-level halftone data, thereby resulting in blended-gray-level halftone data (column 9, lines 41-50 of Tai), wherein the blending performed by the blending circuit weights the first gray-level halftone data and the second gray-level halftone data depending upon characteristics (contrast index) of the image data (column 10, lines 21-30 of Tai).

Tai further discloses an output circuit (figure 6(180) of Tai) communicatively connected to the image buffer (figure 6 (140) of Tai) and configured at least to output the resultant blended-gray-level halftone data (column 8, lines 14-21 of Tai).

Tai does not disclose expressly an edge enhancement circuit communicatively connected to the blending circuit and configured to at least perform edge enhancement on portions of the blended-gray-level halftone data that include text or high-contrast-edge data, thereby resulting in enhanced-blended-gray-level halftone data.

Lee discloses an edge enhancement circuit configured at least to perform edge enhancement on portions of halftone data that include text or high-contrast-edge data, thereby resulting in enhanced halftone data (figure 2a; figure 2b; and column 5, lines 40-49 of Lee).

Tai and Lee are combinable because they are from the same field of endeavor, namely gray level halftone processing and digital gray level image data enhancement. At the time of the invention, it would have been obvious to a person of ordinary

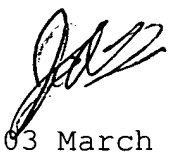
skill in the art to additionally perform edge enhancement, as taught by Lee, upon the blended-gray-level halftone data taught by Tai. The output data would then be enhanced-blended-gray-level halftone data. Furthermore, the edge enhancement circuit would have to be communicatively connected to the blending circuit in order to properly function, and the output circuit would have to be communicatively connected to the edge enhancement circuit since edge enhancement is the operation that occurs immediately prior to output. The motivation for doing so would have been that, without edge enhancement, jagged edges are formed rather than straight edges when the pixels are actually printed on a printer (column 5, lines 40-42 of Lee). Thus, edge enhancement clearly provides superior results in halftone printing. Therefore, it would have been obvious to combine Lee with Tai to obtain the invention as specified in claim 24.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Thompson whose telephone number is 571-272-7441. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K. Moore can be reached on 571-272-7437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



03 March 2006

James A. Thompson
Examiner
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